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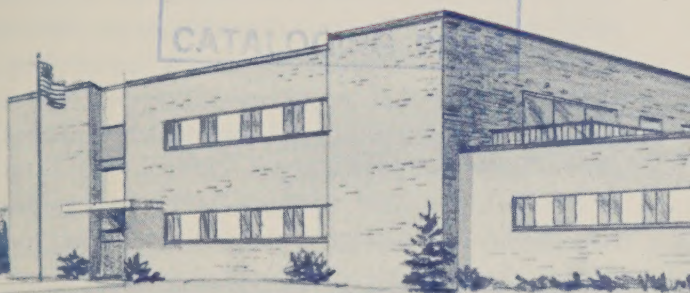


# Human Nutrition Laboratory

*Grand Forks, N. Dakota*

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Agricultural Research Service  
U.S. Department of Agriculture

## **HUMAN NUTRITION LABORATORY GRAND FORKS, NORTH DAKOTA**

The primary program of the Human Nutrition Laboratory is the study of mineral requirements in human nutrition. The goal is to improve the nutrition of the population through the dietary intake of essential minerals.

The Human Nutrition Laboratory, Grand Forks, North Dakota, is a field facility of the Human Nutrition Division, Agricultural Research Service, U.S. Department of Agriculture.

Research at this facility will be in three areas:

### **1. Defining the Essential Minerals.**

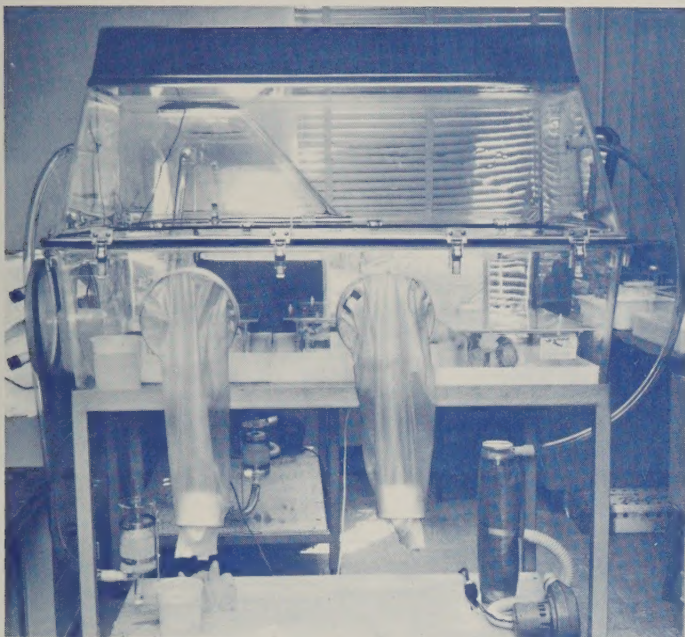
Minerals are essential for good health and well-being. They have been discovered in the past at the approximate rate of one a decade. Therefore, we cannot assume that all essential minerals are yet known. The function of essential minerals is being studied by inducing severe experimental deficiencies in laboratory animals.

### **2. Defining the Human Requirements of Essential Elements**

The daily human requirement for some of the trace elements (minute quantities of essential minerals) are now known. Past estimates for others are being revised. Daily requirements are not always the same, even for the same individual. Recent research has shown that trace element metabolism is greatly influenced by various forms of stress—such as infections, burns, and wounds—and by body hormones and age.

Furthermore, the definition of requirement must take into consideration (1) the elements available in various dietary sources (which differ widely), (2) changes in food processing, and (3) eating habits.

Scientists at the Human Nutrition Laboratory will attempt to define human requirements by measuring trace element metabolism in man as influenced by the factors mentioned above. They hope to arrive at a recommended diet that will assure satisfactory and safe levels of available minerals.



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The controlled environment of this isolator is used in nutrition studies to produce trace element deficiencies.

### **3. Determining the Mineral Nutritional Status of the Population**

Satisfactory mineral nutritional status has been taken for granted in the past. More recently, it has become evident that marginal deficiencies of several trace elements exist in parts of the population. The extent of these is largely unknown. An assessment of the nutritional state is meaningful only when compared to satisfactory levels. Although data on "average" trace element concentrations in man are available, these cannot necessarily be used to establish the satisfactory levels.

This Laboratory will try to define such levels and will investigate the possible occurrence of deficiencies in essential minerals resulting from age, various forms of stress, and dietary lack due to geographical location.

## **THE FACILITY**

The Human Nutrition Laboratory is located on the campus of the University of North Dakota, Grand Forks, near the School of Medicine. It provides chemical laboratory space and a nine-bed metabolic ward. When fully staffed, the Laboratory will have 10 senior scientists including physicians, biochemists, analytical

chemists, nutritionists, and dieticians. In addition to the permanent staff, there will be space for visiting scientists and collaborators from Agricultural Experiment Stations and universities.

"Clean rooms" are planned in which experimental animals will be raised under maximum environmental control. Research equipment including a whole-body counter that measures the metabolism of radioactive tracers will be added later.

## **METABOLIC WARD UNIT**

Housed within the facility is the Metabolic Ward Unit. This Unit is administered by the Vitamin and Mineral Nutrition Laboratory but is utilized by all of the laboratories within the Human Nutrition Research Division. The Unit will be used in determining the human requirements for nutrients in addition to minerals, and for other metabolic studies.

## **INVITATION**

A program such as this can be successful only if it is conducted on a broad collaborative basis. We invite all individual scientists and groups interested in trace-element research to join us in our effort.

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